REMARKS

Claims 1, 2, 5, 6, 8 and 10-34 are pending. The above amendments are presented in the format described by the proposed revision to 37 CFR § 1.121, and as such, no clean copy of the amended claims is being provided.

I. New Claims/Claim Amendments

Claims 1 and 5 have been amended to recite thickness of the corrugated aluminium stiffener sheet of former Claims 2 and 20, respectively.

Claims 2 and 20 have been amended to recite thicknesses and spacing of the external plates/sheets as supported by the next to last paragraph at page 9 of the present specification.

Claims 10, 11, 31 and 33 has been amended to recite thickness of the corrugated aluminium stiffener sheet supported by former Claim 2.

II. 35 USC § 103

Claims 1, 2, 5, 6, 8, 10-25, 27, 28, and 31-34 stand rejected under 35 USC § 103 as being unpatentable over EP 799,900 in view of Sale, Jr. et al. (U.S. Patent No. 3,685,229) and optionally "Metals Handbook Desk Edition" pp. 445, 450. The alloy of EP '900 is only disclosed for plates. The Office Action asserts EP '900 discloses each feature of the rejected claims, except for the following:

(a) the PS/UTS ratio in the H or O temper of the alloy; or

(b) the recited alloy is corrugated and secured to a parallel plate or sheet.

The Office action asserts deficiency (a) is inherently achieved if the EP '900 alloy is used and Sale, Jr. et al. makes up for deficiency (b). Sale, Jr. et al. does not disclose any specific composition, other than a general mention that "steel, aluminium, etc." would be a suitable material (Sale, Jr. et al, column 4, lines 4-31). The "Metals Handbook" discloses sheet thicknesses. This rejection is respectfully traversed.

It is respectfully submitted there is no motivation to select the claimed alloy or the alloy of EP '900 from the vast universe of "any suitable material such as steel, aluminum, etc." listed by Sale, Jr. et al. Moreover, making this selection achieves unexpected advantages.

Present independent product Claims 1, 5, 31 and 33 recite a welded composite panel including up to 3 mm thick corrugated material, having in an H-condition or in an O-condition a ratio of PS/UTS in the range of 0.4 to 0.9 and having good roll formability.

The claim 1 term "good roll formability" is taken to be "good bendability" defined as passing ASTM E-290 explained at page 13 of the present specification. The alloy has good bendability so it can form the corrugated sheet without cracking during roll forming (see page 1 of the present application). Roll forming is explained at page 1, line 31-page 2, line 3, of the present specification as a continuous process of "forming metal from sheet, strip, or coiled stock into desired shapes of essentially uniform thickness by feeding the stock through a series of roll stations equipped with contoured rolls, see Metals Handbook, 9th edition, Vol. 14, ASM International, 1988, pp. 624-635.

A. Unpredictability

As stated at paragraph 14 of a concurrently filed Rule 132 Declaration, by a non-inventor skilled in the art, EP '900 does not provide enough information to teach its alloys would be suitable for roll forming corrugated structures of the present invention. Thus, it is respectfully submitted, at best it is obvious to try the alloy. However, obvious to try is not a basis for an obviousness rejection.

It is well known that not all steel or aluminum alloys would be suitably strong and roll formable for the present invention. For example, as stated at page 1, lines 23-30, of the present application,

> "large engineering structures such as cargo or passenger decks of a ship can be constructed by joining pre-fabricated aluminium products produced by joining and/or welding of a number of roll formed corrugated sheets. The realization of this approach relies on the availability of high strength corrugated aluminium alloy product shapes. This requires aluminium alloy sheets that are not only easy to roll form but also have higher strength. Standard available aluminium alloy feed stock for roll forming such as AA3004 alloy do not develop high enough strength to achieve significant weight reduction."

As stated at page 2 of the present application, "It is an object of the invention to provide a composite aluminium panel comprising corrugated aluminium stiffener sheet that combines a 20% higher strength than standard AA3004 alloy with good formability at these higher strengths and good weldability."

The present independent claims recite the corrugated stiffener sheet has a maximum 3 mm thickness. This emphasizes selecting an alloy to have strength and formability to be suitable for this. As stated at page 9, lines 24-28, of the present specification: "By using the aluminium alloy product of the invention at these relatively thin gauges and applied in a composite aluminium panel as set out above, it is achieved that significant weight reduction can be obtained in construction while maintaining at least the same strength and/or stiffness levels as previously known in the art."

EP '900 at page 2, lines 28-30 discloses its Al-Mg alloy plate has substantially improved strength as compared to AA5083, but bendability, and stress and exfoliation corrosion resistances equivalent to AA5083 alloy. However, the concurrently filed Rule 132 Declaration explains that EP '900 does not provide enough information to teach its alloys would be suitable for Contour Roll Forming corrugated structures of the present invention.

The concurrently filed Rule 132 Declaration also explains that Sale, Jr. et al.'s teaching of "steel, aluminum, etc." is too broad to provide any guidance to select the alloys of EP '900. It is respectfully submitted it is unexpected that the present alloys would be suitable for the claimed composite panel until a representative sample is tested.

Rather than repeat the assertions in the Declaration they are incorporated into this response by reference. However, it is noted that Paragraphs 7-9 explain that EP '900 does not provide enough information to predict a 3 mm thick sheet of its alloy would be sufficiently strong and formable or the properties after it is welded. Paragraph 10, states an alloy having sufficient strength might not have sufficiently good formability. Paragraphs 11 and 12 explain plate alloys are not necessarily good corrugated sheet alloys. Paragraph 13 that the corrosion resistance data for EP '900, Table 2 is for non-welded material. Thus, it is unpredictable to extrapolate the data to welded material of the present claim.

Applicants respectfully also submit the Metals Handbook reference does not cure the deficiencies discussed above.

B. Unexpected Results

It is respectfully submitted the present invention recognizes its alloys, even if some overlap elemental ranges of EP '900, unexpectedly have a favorable combination of characteristics, namely, roll-formable, sufficiently high strength, good corrosion resistance and good weldability, allowing the construction of a composite panel joined by welding which unexpectedly can withstand a severe marine environment. As explained at paragraph 15 of the concurrently filed Rule 132 Declaration, the present invention is unexpectedly better than industry standard material AA3004. There is no way to combine Sale et al and EP '900 to make a comparative example because Sale, Jr. et al discloses no specific alloy and the alloys of EP '900 are only presented as non-welded plates. Thus, the better comparison is against industry standard AA3004 as done at pages 13-15 of the present application.

C. Commercial Success

Paragraph 15 of the concurrently submitted Rule 132 Declaration also states the assignee has brought on the market laser welded panels having the construction and composition subject of the pending claims under the trade name CORALDEC. A copy of information on this may be down loaded from the website:

www.corusgroup-koblenz.com/english/products/shipbuilding/coraldec/inhalt.htm

A copy of this downloaded information is attached as ATTACHMENT I to the concurrently filed Rule 132 Declaration. These composite panels use Assignee's ALUSTAR-alloy (both as the corrugated sheet and for the parallel plates) falling within the present claims and have been employed commercially in a large 90 m long sailing ship build by Royal Huisman Shipyard in the Netherlands (see also the above mentioned web-site). 52 welded decks have been constructed and used. The length of these decks were up to 4 meters, and all having a width of 0.8 meters, and all having a height of 100 mm.

III. Dependent Claims Further Distinguish Over the References

Amended Claims 2 and 20 further distinguish over the references by reciting plate dimensions such that a selection of an alloy for the corrugated sheet to be located between these sheets is further unobvious.

Claims 15 and 25 further distinguish over the references by defining corrugated stiffener sheet thickness in the range of 0.2 to 1.0 mm such that a selection of a suitable alloy for the corrugated sheet to be located between parallel sheets is further unobvious. This highlights the unexpected advantage of producing a lighter weight composite panel.

Claims 35 and 36 recite use in a marine environment to further distinguish over the references. Sale, Jr. et al. discloses a structure used to form built-up panel units to form lightweight modules to build works like sheds, and airplane hangars (see column 1, lines 10-12, and column 1, line 65 to column 2, line 10). In contrast, the alloy of the present invention provides a composite panel which is joined by means of welding thereby exploiting the good welding characteristics of the stiffener sheet and the good corrosion performance, in particular when having a Zn-content of more than 0.4% as currently claimed.

IV. Conclusion

In view of the above, it is respectfully submitted that all objections and rejections are overcome. Thus, a Notice of Allowance is respectfully requested.

Respectfully submitted,

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